CHALLENGING CASE: BEHAVIORAL CHANGES

School Refusal and Emotional Lability in a 6-Year-Old Boy*

CASE

At the end of a busy office day, a general pediatrician returns a phone call from a mother who is concerned about the emotional response to school of her 7-year-old boy. The pediatrician discovers that Scotty has been crying with progressively greater intensity each morning for the past 3 weeks since the beginning of school. Shortly after awakening, crying is initiated and does not stop until 30 to 60 minutes after he is taken to school. He does not want to be taken to school, but his mother insists that he go to school each day. His sleep pattern has been altered on three occasions in the past week when he awoke and cried for about 15 minutes.

Scotty had a positive experience in the first grade the year before in another city. He was described by his mother as one of the best readers in his class. He enjoys computer games, which he learns quickly. A 3-year-old sister and a 6-month-old brother are in good health. Scotty’s medical history and developmental milestones and a brief review of systems were normal. Specifically, his mother denied medications, other unusual behaviors, headaches, vomiting, abnormal gait, or appetite changes.

The pediatrician’s initial assessment from the data available from the telephone consultation was that Scotty was experiencing significant emotional lability associated with several factors, including a new school (and neighborhood), loss of friendship, and the cumulative effect of the resettling process and the young infant on his mother’s time and emotional energy. In addition, it seemed possible that Scotty was a gifted child in a school or classroom that was not consistent with his learning potential.

A plan was developed that included an immediate psychoeducational assessment with an educational psychologist familiar with local schools and a pediatric appointment in 1 month. Over the next month, Scotty’s emotional outbursts and school refusal persisted. The psychological evaluation revealed a bright child without a learning disability but with an anxiety neurosis related to recent life event changes and with a tendency to internalize strong feelings. Individual psychotherapy was recommended.

At the pediatric office visit, Scotty’s history had not changed. He was cooperative, interactive, and attentive. The physical examination was normal until the neurological component, which revealed bilateral past pointing on finger-to-nose testing, very brisk (4+) deep tendon reflexes, and a Babinski response of the left toe. Cranial nerves and gait were normal. Ataxia, focal weakness, dysarthria, and papilledema were absent. Reading, adding skills, and short-term memory with number sequencing were intact. A computerized axial tomography study of his brain revealed normal size ventricles with a large mass in the pons most consistent with a brain stem glioma.

Dr. Martin Stein

Clinical problems classified as high frequency-low morbidity make up the daily practice or primary care clinicians. Within the predictable spectrum of these physical, developmental, and behavioral diagnoses, often there are unexpected problems (both serious and benign). These diagnostic challenges are framed in two ways. Some children present with an unusual constellation of symptoms that reflects a common problem; for example, the school age child with acute abdominal pain, frontal headache, and fever without any respiratory symptoms is found to have an exudative tonsillitis secondary to streptococcus. Other children present with frequently seen symptoms that reflect an uncommon disorder. The case under discussion is of the second form.

I chose this case for several reasons. It exemplifies the clinical vigilance required by the generalist. Diagnostic probability is the foundation of decision making when faced with a new set of symptoms or signs. We select tests, request consultation, or choose to observe the patient based on a reasoned assessment of available data. Cost of procedures and consultations, psychological effects of the diagnostic process on the child and family, and the probability that the expenditure in time and money will result in information beneficial to the patient are the components of this decision process.

Scotty’s diagnosis was delayed because his symptoms, school phobia and irritability (both commonly seen in pediatric practice), appeared to be secondary to several situational events in his life. Although brain tumors are the most common form of solid tumor in children, the individual pediatrician does not see many children with this diagnosis. This must be juxtaposed against the observation that personality changes are seen frequently as an early manifestation of central nervous system tumors.

* Originally published in J Dev Behav Pediatr. 1996;17(3)
PEDIATRICS (ISSN 0031 4005). Copyright © 2001 by the American Academy of Pediatrics and Lippincott Williams & Wilkins.
Three clinicians with different backgrounds have been asked to comment on this case. Dr. Patricia Duffner is Professor of Neurology and Pediatrics at the Children's Hospital of Buffalo. Her field of interest is brain tumors in children. Dr. John S. Werry is Emeritus Professor of Psychiatry at the University of Auckland where he has had extensive experience with emotional problems of children and adolescents. Dr. Doris Trauner is Professor of Pediatrics and Neurology at the University of California, San Diego where her special interest in recent years has been neurocognitive disorders in children.

Dr. Patricia K. Duffner

A change in personality is one of the most important, albeit nonspecific, signs of structural disease of the nervous system. The child in this case report presented with irritability, crying, and sleep disturbances but had a previously psychologically stable state. The pediatrician did not clinically examine the child for 1 month, but rather referred him for an immediate psychoeducational evaluation. When the child was finally examined by the pediatrician, a potpourri of neurological abnormalities led to a scan and the correct diagnosis of a pontine glioma.

Although personality change, depression, and irritability most commonly reflect psychosocial problems, it is extremely important for the pediatrician to remember that personality change is one of the most sensitive indicators of changing neurological function. Alterations in mental state occur not only with supratentorial tumors but with infratentorial tumors as well. Mental symptoms in children with brain stem gliomas are well known. Lassman described two succeeding phases in the personality changes of children with brain stem gliomas. In the first phase, the children become withdrawn, apathetic, and lethargic. They cry easily and decline in their school performance. In the second phase, the children become more aggressive and hyperactive and at times become violent. Nightmares and night terrors have also been reported.

In other studies, the incidence of mental symptoms with brain stem gliomas has ranged from 11 to 50%. Of interest, in some patients, the mental symptoms may be the first presenting sign of the tumor. It is believed that the majority of the mental symptoms seen in children with brain stem gliomas do not reflect increased intracranial pressure. Indeed, most of these children did not have hydrocephalus. Rather, the psychological symptoms presumably relate to the infiltrative nature of the tumor in the brain stem. Some authors have suggested that those tumors that are lower down in the brain stem, i.e., those in the medulla and lower pontine region, are more likely to be associated with psychological disturbances than those tumors that are located in the mesencephalon.

The lesson to be learned from this case is that a change in personality or a decline in school performance should immediately lead the pediatrician to a complete and detailed neurological examination before bringing the child in for a psychological evaluation. Fortunately, with a brain stem glioma, it is not likely that the delay in diagnosis has had an impact on prognosis because definitive treatment has not yet been identified. Nonetheless, children with other types of posterior fossa tumors may also present with behavioral disorders as their primary presenting symptom, and, in these, early diagnosis and treatment are quite important. In children with posterior fossa masses, a detailed neurological examination will typically elicit clear-cut signs relative to the part of the nervous system involved. Thus, the child with the brain stem glioma will have ipsilateral cranial neuropathies associated with contralateral pyramidal tract signs as well as ipsilateral cerebellar signs.

The child with medulloblastoma or cerebellar astrocytoma will likely have signs of increased intracranial pressure as well as either truncal or appendicular ataxia. Somewhat more problematic is the child with the supratentorial tumor who may only present with behavioral changes and decline in school performance in the presence of a normal neurological examination. These patients can be extremely difficult to diagnose early on in their course.

Thus, this case reminds us that a changing psychological state may reflect structural disease of the nervous system, and as such, the child merits a detailed neurological evaluation.

Dr. John S. Werry

This case is every doctor's nightmare: a psychiatric diagnosis has been assigned to what turns out to be a physical disorder. The neuropsychological consequences of brain tumors in children are poorly studied, but, theoretically, like other cerebral pathologies, tumors can have two kinds of behavioral effects: those that arise directly from disturbances in brain function and those from the child's reaction to the neurological symptoms. In children for whom the presentation is "behavioral" rather than neurological, the most typical findings are deterioration in intellectual functions such as school performance rather than in personality or emotions.

Neuropsychologically induced changes in personality or behavior are less likely to result from infratentorial than cortical tumors, at least not until there is interference with cortical and upper brain stem function (thalamus, hypothalamus, etc.). This would most likely result from raised intracranial pressure, so impaired consciousness or delirium-like states would seem more likely than an anxiety state.
Despite the size of the tumor, clinical signs in Scotty seem to have been confined to the motor system; but children of this age often have difficulty describing discomfort, so we cannot assume that Scotty was feeling well. Thus, it is likely that the incipient neurological dysfunctions would have resulted in some significant level of discomfort that, coming at a time of psychological vulnerability, probably played some significant role in the anxiety state.

This case was handled initially by a telephone call and a psychological assessment. We need to ask if there were any reasons to suspect that the initial diagnosis of a psychological reaction might be incorrect. The only pointer is that a child who has no previous history of separation or other anxiety is unlikely to present suddenly thus other than transitorily, and a physical check might therefore have been prudent.

However, this is the wisdom of hindsight, and cases like this are most uncommon (in 35 years of child psychiatry in a children's hospital, I have only seen two children with brain tumors who were initially misdiagnosed as having a psychiatric disorder; only one presented with anxiety, and she had a hypotalamic tumor). Medicine is a game of probabilities, and thus there are risks in falling back on what is common. Further, although everyone remembers this kind of case, the reverse (what is initially assumed to be a physical disorder turns out to be a psychiatric one), is far, far more common and is equally damaging much of the time. It is just as unacceptable in medicine to diagnose psychological as physical as the reverse. The name of the game in diagnosis is to get it right.

The last point to be made here is to stress that it is always dangerous to assume that a child’s behavior is due to “stress” or “family dysfunction” because it is rarely possible to demonstrate unequivocally a causal link between the stress and the behavior. A lot of what was supposed to be caused by stress is now known to be at least in part genetic or neuropsychological. It was for this reason that the DSM-III changed the focus in psychiatric diagnosis away from purported psychological etiologies back to signs and symptoms. And, there has been a major change in the direction of psychiatric research away from psychodynamics to neuropsychology and from psychobabble to science.

With all due respect, nonmedical professionals lack the “bio” part of the biopsychosocial frame of reference that distinguishes (or ought to) behavioral pediatrics and child psychiatry from the other mental health professions. It is our responsibility as physicians to ensure that there is no physical disorder.

JOHN S. WERRY, MD
Department of Psychiatry
University of Auckland
Auckland, New Zealand

REFERENCES

Dr. Doris A. Trauner
This case highlights a difficult diagnostic dilemma for the pediatrician. School phobias and sleep disturbances are not uncommon in this age group. However, many diverse neurological conditions can also occur in childhood. With many of these neurological disorders, the initial manifestation may be isolated behavioral changes, without evidence of obvious motor, sensory, or coordination problems, seizures, or headaches. Every physician is alert to the “typical” symptoms of a brain tumor, such as early morning projectile vomiting, severe headache, ataxia, or dysarthria, that will immediately evoke concern about a mass lesion. However, there are many more insidious presentations, including personality changes, behavioral disturbances, irritability, drop in school performance, and social withdrawal, that may not immediately call to mind a concern about this diagnosis. Other neurological conditions occurring in childhood that may have isolated behavioral changes for months before other symptoms arise include, in addition to brain tumors: metabolic disorders such as Wilson disease and thyroid dysfunction; degenerative disorders such as adrenoleukodystrophy, juvenile ceroid lipofuscinosis, and subacute sclerosing panencephalitis; toxic encephalopathies such as chronic lead exposure; nonconvulsive epilepsies such as Landau-Kleffner syndrome; and subacute or chronic infections of the nervous system, such as fungal meningitis.

When should the busy pediatrician consider a neurological etiology in a child with a change in behavior? Behavioral symptoms caused by neurological problems and those that are primary behavioral disorders cannot be distinguished by history, so a neurological etiology should be considered in every child presenting with a behavioral complaint. This does not imply that a neuroimaging procedure, electroencephalogram (EEG), or other test be performed on every child. However, any child with a change from usual behavior patterns should have a thorough neurological examination as part of the assessment. If any abnormalities are uncovered as part of that exam, further diagnostic studies would be warranted. Similarly, if a psychological assessment suggested evidence of organic dysfunction then further neurological tests would be indicated.

Given the diverse types of disorders that are capable of causing behavioral symptoms, there is no specific list of tests that are appropriate. A neuroimaging study will identify mass lesions and demyelinating disorders and may provide evidence of chronic infection. If the latter is a serious consideration, a lumbar puncture is mandatory. Landau-Kleffner syndrome, a form of developmental or acquired expressive aphasia associated with an epileptic pattern on EEG and responsive to anticonvulsant or steroid
therapy, can be diagnosed with a sleep EEG. A search for metabolic disorders would be tailored to the specific condition suspected, e.g., serum copper and ceruloplasmin, 24-hour urine copper, and perhaps a penicillamine challenge to look for Wilson disease. The behavioral manifestations of many of these conditions may improve or disappear with treatment, especially in the early stages; however, if diagnosis is delayed, symptoms may persist despite adequate treatment of the underlying condition. Thus, pediatricians should have a high index of suspicion for possible neurological etiologies when a child presents with a behavioral concern.

Doris A. Trauner, MD  
University of California, San Diego  
San Diego, California

REFERENCES

Dr. Martin Stein

Dr. Werry recalled the value of the retrospectoscope when we attempt to untangle events that lead to an unexpected diagnosis. The “retro” vantage point, in fact, may be a painful learning mechanism, as illustrated in the case of Scotty. Were there early clues in the case history that may have initiated an early physical examination? Dr. Werry noted that Scotty had not experienced prior separation problems or other anxiety symptoms. Considering the intensity and duration of this child’s school refusal and irritability, coupled with the absence of a prior behavioral disorder, perhaps a neurological diagnosis should have been entertained at an earlier stage.

There was unanimous agreement among the two pediatric neurologists and the child psychiatrist that a neurological disorder should always be considered in a child with behavioral symptoms. Dr. Duffner was emphatic on this point when she wrote that “personality change is one of the most sensitive indicators of changing neurological function.” She described a study in the literature that defined two phases of personality change in children with Scotty’s lesion. In that study of children with brain stem gliomas, apathy, crying easily, and diminished school performance were followed by hyperactivity and aggression, nightmares, and night terrors. Dr. Trauner elaborated five symptoms that described an insidious forerunner of a brain tumor, including personality changes, behavioral disturbances, irritability, decline in school performance, and social withdrawal.

It is not surprising that many central nervous system tumors in children manifest with behavior and personality changes rather than the seizures and focal neurological deficits seen with adults. In children, most of these tumors are located in the posterior fossa where hydrocephalus and focal neurological signs develop gradually. Typical symptoms of central nervous system tumors in children (headache, vomiting, and visual disturbance) are a result of an obstructive hydrocephalus. The precise neuroanatomical pathways and neuroreceptor alterations that produce behavioral change as a result of neurological disease remain unclear. Dr. Duffner noted that personality changes in brain stem gliomas probably are a result of the infiltrative nature of the tumor in the brain stem, rather than hydrocephalus. In fact, Scotty’s initial head magnetic resonance imaging demonstrated the absence of hydrocephalus.

Dr. Werry made the keen observation that neurological disease can produce two kinds of behavioral effects: behavior that is a direct result of altered brain function and behavior that reflects a child’s reaction to neurological symptoms. Scotty’s school refusal and frequent crying episodes may have been a result of a diffuse sensation of irritability. That chronic illness is associated with secondary behavioral symptoms as a result of not feeling well is an important principle in a variety of other chronic pediatric diseases. Pediatricians often see children with asthma who experience chronic fatigue, irritability, social withdrawal, and school dysfunction; all of these symptoms in a poorly controlled asthmatic child can be reversed by appropriate use of medication, environmental change, and supportive care. At other times, occult sinusitis may be the trigger for a multitude of behavioral symptoms that resolve with antibiotic treatment. A less common example of this same phenomenon is a personality change associated with chronic inflammatory bowel disease before the development of gastrointestinal symptoms.

This case represents the shared symptomatology between behavioral and physical diseases. It has often been said that, in the diagnostic process, beginning with a medical history, the clinician should strive to integrate physical and behavioral aspects of a patient’s life simultaneously. Seasoned clinicians learn this process through experience. Our challenge is to find ways to teach the process of what George Engel termed “biopsychosocial” medicine to students and residents at an early stage in their education.
School Refusal and Emotional Lability in a 6-Year-Old Boy
Martin T. Stein, Patricia K. Duffner, John S. Werry and Doris A. Trauner
Pediatrics 2001;107:838

Updated Information & Services
including high resolution figures, can be found at:
/content/107/Supplement_1/838.citation

Subspecialty Collections
This article, along with others on similar topics, appears in the following collection(s):
Developmental/Behavioral Pediatrics
/cgi/collection/development:behavioral_issues_sub
Cognition/Language/Learning Disorders
/cgi/collection/cognition:language:learning_disorders_sub
Growth/Development Milestones
/cgi/collection/growth:development_milestones_sub
Psychosocial Issues
/cgi/collection/psychosocial_issues_sub

Permissions & Licensing
Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
/site/misc/Permissions.xhtml

Reprints
Information about ordering reprints can be found online:
/site/misc/reprints.xhtml
School Refusal and Emotional Lability in a 6-Year-Old Boy
Martin T. Stein, Patricia K. Duffner, John S. Werry and Doris A. Trauner

Pediatrics 2001;107;838

The online version of this article, along with updated information and services, is located on the World Wide Web at:
/content/107/Supplement_1/838.citation